Natural Gas Distribution
in
Hay River and Pine Point
Northwest Territories

The Public Utilities Board
of
The Northwest Territories

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INTRODUCTION

The high cost of all forms of energy presently used for home and industry in the Northwest Territories is a matter of some concern to both Federal and Territorial Governments. Ways are constantly being examined to ease the energy burden on residents in the north.

One method to accomplish this is the replacement of oil and propane that have high transporation costs, with piped natural gas. This report examines the proposals of two gas distribution companies to effect this replacement.

Early in 1983 ICG Utilities (Northwest Territories) Ltd. applied to the Town of Hay River, Northwest Territories, for a franchise to distribute natural gas and other forms of gaseous energy in the town. The application also proposed distributing natural gas in a number of other communities, including Pine Point.

On March 21, 1983 a similar application was made to the Town of Hay River by Northland Utilities (NWT) Limited.

Faced with these two applications, the Town Council wrote to the Commissioner of the Northwest Territories on April 27, 1983, requesting assistance in the review of the applications. In June, 1983 the Public Utilities Board of the Northwest Territories was instructed to assist the Town. Subsequently the Board decided to employ consultants with experience in the natural gas distribution industry to advise the Board. Accordingly, I.D. Engineering Company of Winnipeg, Manitoba were retained to assist the Board in the assessment of the two proposals received for the distribution of Natural Gas in the Town of Hay River and the surrounding communities.

In order that a thorough examination might be made of the ability of the two applicants to undertake the project, guidelines were drafted by the consultant and sent out by the Board to the applicants in August 1983. Submissions consisting of revised copies of their original submissions to the Town of Hay River were received in September 1983.

Hearings were held with each applicant in turn before the Public Utilities Board and the Town Council of Hay River on December 15, 1983, to consider the submissions of the applicants and receive any additional information requested by the Board, Council or consultant, or submitted by the applicant. The hearing of each applicant was closed to the public, the press, and the other applicant to ensure that neither applicant received undue advantage over the other.

All of the studies and analyses have been completed and the results are compiled in this report.

CHAPTER I

THE APPLICANTS

I. THE APPLICANTS

NORTHLAND UTILITIES (NWT) LIMITED

Northland Utilities (NWT) Limited, (hereinafter referred to as Northland), was incorporated in the Northwest Territories on December 30, 1982.

Northland is a subsidiary of Alberta Power Limited, which is itself a subsidiary of Canadian Utilities Limited. Alberta Power has been providing electrical service to the Hay River area since 1951 and will continue to do so under the Northland name.

Canadian Utilities Limited has been involved in the development of electrical and natural gas utility service in Alberta, the Northwest Territories and the Yukon since the early 1900's. Through a subsidiary Northwestern Utilities Limited it serves approximately 300,000 customers in the northern part of Alberta. A sister company, Canadian Western Natural Gas Company, distributes natural gas in the southern portion of Alberta, providing service to approximately 250,000 customers. In total, the Canadian Utilities Group of Companies provides gas services to more than 90 percent of the province of Alberta.

In 1982 the total amount of natural gas sold and transported by the Canadian Utilities Group of Companies was 409,944 terrajoules. Of this total, sales to some 568,000 residential, commercial and industrial customers amounted to 347,295 terrajoules or 9,169 million cubic meters. Consolidated revenues for the year in these operations were $959.1 million, with operating expenses of $897.5 million.

Canadian Utilities Limited provides certain centralized service to its subsidiaries including centralized computer and management information systems, management, industrial relations, corporate secretarial and legal services, and the costs are shared by the subsidiaries. Such services would be provided to Northland on the same basis.

Northland has indicated that it would receive the financial backing of Canadian Utilities Limited at rates and on terms and conditions as are obtained by its parent. These rates would flow from Canadian Utilities' ability to obtain financing in public markets at the lowest possible cost due to its high bond rating.

ICG UTILITIES (NORTHWEST TERRITORIES) LTD.

ICG Utilities (Northwest Territories) Ltd., (hereinafter referred to as ICG-NWT), was incorporated pursuant to the laws of the Northwest Territories in September 1983 for the express purpose of obtaining a permit to construct and operate natural gas facilities in the Northwest Territories.

ICG-NWT is a wholly-owned subsidiary of ICG Utilities (Plains-Western) Ltd., itself a subsidiary of ICG Utilities Ltd. which in turn is a division of Inter-City Gas Corporation of Winnipeg, Manitoba. Inter-City, a Canadian-owned corporation, was incorporated in 1954 for the purpose of distributing natural gas to rural communities in Manitoba. Since its initial development, Inter-City has expanded its utility operations to various communities in Manitoba, Alberta, British Columbia, Ontario, Quebec, and Minnesota, and is pursuing the distribution of natural gas in New Brunswick.

In addition to the distribution of natural gas, Inter-City, through its subsidiary Plains-Western Gas and Electric Company, distributes electricity to residents of Yellowknife, NWT. Inter-City is also involved in the production and sale of propane and other petroleum products, and is now the largest marketer of propane in Canada.

In 1982, Inter-City and its subsidiaries sold approximately 1.204 million cubic meters of natural gas to 95,000 customers located in 158 communities in the Province of British Columbia, Alberta, Manitoba, Ontario and in the State of Minnesota with a total operating revenue of approximately

$190 million. On an overall corporate basis, including its operations in manufacturing, exploration and development, and involvement in other energy fields, Inter-City achieved operating revenues of $620,712,000 in 1982, with an operating profit of $67,711,000, and consolidated assets in excess of 3/4 of a billion dollars.

ICG Utilities (Plains-Western) Ltd., (Plains-Western) the parent company of ICG-NWT, has its head office in Leduc, Alberta. This serves as the base of operations for a natural gas utility serving 43,000 customers throughout Alberta and in the Fort St. John area of Northeastern British Columbia. If successful in its application, ICG-NWT would make use of the planning, management and administrative services of Plains-Western.

Other subsidiaries of Inter-City that would be utilized by ICG-NWT include ICG Engineering Ltd. and ICG Liquid Gas Ltd. ICG Engineering Ltd., based at Leduc, offers a broad range of expertise in the design, construction and operation of oil and gas pipelines. It was responsible for carrying out the design, cost estimating and routing studies of the proposal submitted by ICG-NWT to construct distribution facilities in the Northwest Territories.

ICG Liquid Gas Ltd., which provides propane supply services to many communities in the Northwest Territories, including Hay River and Pine Point, has provided extensive local information on these communities for the preparation of ICG-NWT's proposal.

In its application, ICG-NWT has provided resumes of key personnel that were responsible for the preparation of the application and who would have a continuing role in the management of the company.

CHAPTER II

SUMMARY AND CONCLUSIONS

II. SUMMARY AND CONCLUSIONS

A. INTRODUCTION

Two applications for the right to distribute natural gas in the towns of Hay River and Pine Point, and other smaller communities in the vicinity, have been received by the Public Utilities Board of the Northwest Territories. Following an examination of the applications, from Northland Utilities (NWT) Limited, and ICG Utilities (Northwest Territories) Ltd., the main issues of the study are summarized below.

B. SUMMARY

1. Market Study

A market study was carried out by each of the applicants, to determine the number of potential customers and to estimate the natural gas load that would be required. While there are some differences in the classification of customers and the number of adjoining communities included in the market surveys, the results of the two studies are similar.

2. Alberta Power Generation Plant

The natural gas load projected for this plant is critical for the viability of the system. Based on figures quoted by the applicants the load would amount to from 35 to 40 percent of the total projected annual load for Hay River.

Northland has stated that the price of natural gas would have to be 50% of the price of diesel fuel in order for it to consider conversion of the plant. Conversion to natural gas would probably entail replacement of the existing diesel units with gas turbine units.

It is unlikely that ICG-NWT could attach this substantial load at gas rates that are only 25% of present fuel.

3. Capital Cost of Distribution

Both applicants provided projections of the capital cost of constructing and operating a distribution system. A comparison of the total capital cost for Hay River and Pine Point, expressed in 1983 dollars indicates:

Northland	-	$5,601,000
ICG-NWT	-	$5,743,940

Allowing for minor differences in market surveys and method of estimating, it is evident that the results are essentially the same.

4. Conversion Assistance

The conversion assistance program proposed by ICG-NWT would result in a lower capital cost contribution by the residential customers than would Northland's program. It should be noted, however, that the lower capital cost to the customer will result in a higher rate base for the company and ultimately will mean higher gas rates charged to all customers.

5. Distribution System Expansion Program - DSEP

To make the proposed distribution system project economically viable, a grant of approximately $25 million will be required. Negotiations will have to be entered into with the Federal Government to obtain this substantial amount.

The present DSEP program of Energy Mines and Resources Canada will terminate on March 1, 1987, with final applications being accepted on March 1, 1986. Since the program has established maximum grants per project of $10 million in the first year and $5 million in the second, an application would have to be made prior to March 1, 1985 to be eligible for a total of $15 million in DSEP grants before the program runs out.

However, even if the maximum of $15 million is obtained under the program, this stills leaves a shortfall of $10 million to be obtained from other sources.

6. Standards of Construction and Operation

There is little difference in the standards of construction, operation of the utility and provision of service, proposed by the two applicants. Both applicants are subsidiaries of large gas distribution utilities, that have operated successfully for many years in other parts of Canada.

In the Consultants opinion, either applicant is capable of constructing and operating the proposed system.

7. Franchise Agreement

The applicants have both requested long term franchise agreements with the Town of Hay River, in the order of 20 or 21 years. They have both stressed that a franchise agreement is required to permit them to negotiate grants and a firm gas supply.

However, it would be imprudent for the Town of Hay River to grant a long-term franchise agreement to any company until it assured that the project will proceed within a reasonable period of time.

Therefore, should the Town Council decide that it wishes to proceed with the project, it should consider reaching an interim agreement with the selected distributor. Such an agreement might provide:

i) That the utility has the exclusive right to enter into negotiations for grants and gas supply for the establishment of a natural gas distribution system in Hay River.

ii) That this agreement would be for a period of three to five years. A suggested date would be December 31, 1987. Extension of this time would be subject to negotiation.

iii) A long-term agreement would be entered into by the Town when it is clearly evident that funding has been arranged and a firm gas supply is available.

8. Gas Supply

In the opinion of the Consultants, the only viable source of natural gas proposed by the applicants at this time is by means of the Steen River lateral from Zama Lake.

While there are sources closer to Hay River, particularly in the Cameron Hills field, there is not a sufficient proven quantity and well capability, to ensure a firm supply.

9. Gas Rates

Northland has proposed gas rates that would be 50% lower than existing energy rates in Hay River. ICG-NWT have indicated that rates that are 25 to 35% less than existing energy rates would provide the incentive for customers to convert.

It is evident that rates at 50% would result in an early attachment of the industrial load, so vital to the viability of the system. Whether rates of this magnitude can be obtained will depend on a large part on the final cost of gas delivered to the Town gate.

C. CONCLUSIONS AND RECOMMENDATIONS

At a December 15, 1983 meeting with its consultants, the Northwest Territories Public Utilities Board directed its consultants to include in its analysis and final report a recommendation as to which of the two applicant companies should be recommended to undertake the project. It was made clear, however, that such recommendation would not commit the Board or the Town of Hay River to any decision and that the report was to be considered as only one source of information for guidance in the decision making process.

Although the Town of Pine Point was not present during the proceedings and did not formally express an interest in receiving gas service, both companies indicated they had discussed with either the Town or the major industry Cominco, the possibility of providing a gas supply. It should therefore be understood that the following consultants recommendation applies to both Pine Point and Hay River as though they were a single entity.

The consultants selected five main issues for consideration in order to measure the relative strengths and weaknesses of Northland Utilities (NWT) Limited and ICG Utilities (Northwest Territories) Ltd. These have been used to develop a decision matrix which is shown in Figure II-1. The issues selected are:

1. the ability of the Company to arrange for an adequate gas supply;
2. the ability to carry the project through to completion;
3. the criteria for proposed gas rates;
4. the standards of construction and past experience; and,
5. the level of customer service proposed to be provided.

Each of the five main issues were considered to be of a greater or less importance relative to the others and were assigned a weighting percentage as follows:

		Per Cent
1.	Ability to arrange a gas supply	25
2.	Ability to complete the project	25
3.	The criteria for gas rate setting	35
4.	Standards of construction and experience	8
5.	Customer service	7
		100

Three subjects were carefully considered under each main issue and a one to five rating assigned to each, resulting in a scoring that would permit a logical approach to the final recommendation.

Under the ability to arrange for an adequate gas supply, the Board's consultants considered each company's background and experience relating to gas contracting in Alberta and its experience relating to the maintenance of such contracts within the industry. The company's experience and working relationships with NOVA, AN ALBERTA CORPORATION were also considered as an important element in providing the least cost of gas supply to the Alberta Territories Border. Each applicant's level of experience and strengths in negotiating financial assistance with Federal and Territorial Governments for the project was considered.

The completion of the project involves the ability to provide company financing of the capital cost (estimated by Northland at $8.3 million) as well as the ability to compete for and obtain distribution system expansion program payments (DSEP) from the Federal Ministry of Energy, Mines and Resources. Also, an important consideration was the strength of each applicant relating to experience in the construction and operation of high pressure transmission pipeline facilities.

Under the "Criteria for Gas Rates" the consultants gave careful attention to the proposed rate levels relative to competing fuels that would be necessary to capture the residential/commerical and large industrial loads. An additional important consideration was the proposed level of

proposed level of gas rate and its ultimate effect on Hay River electric rates over the long-term. The ability to attach the electric generating plant and the large Pine Point industrial potential were also important considerations in the scoring of each applicant company.

In regard to the standards of construction, the consultants considered the applicants experience with plastic pipe installation, and their past experience in undertaking expansion projects.

Both applicants provided details relating to service on the customers premises, appliance conversion assistance and the ability to respond to an emergency such as a line break.

It is the opinion of the consultants, having carefully considered the issues, that Northland Utilities (NWT) Limited be recommended as the strongest applicant to undertake the project under terms and conditions mutally acceptable to the Towns of Hay River, Pine Point and the Company.

FIGURE II-1

DECISION MATRIX FOR SELECTION OF

A GAS DISTRIBUTOR FOR HAY RIVER AND PINE POINT

MAIN ISSUES		NORTHLAND		ICG-NWT	
		1 to 5	Score	1 to 5	Score
ABILITY TO ARRANGE GAS SUPPLY: - Producer Contracts - Nova Contract - Federal Grants	25%	4	1.00	3	0.75
ABILITY TO COMPLETE THE PROJECT: - Financing Ability - Construction Experience - DSEP Grants	25%	3	0.75	3	0.75
CRITERIA FOR GAS RATES: - Relative to Alternatives - Effect on Electric Rates - Attachment of Industry	35%	4	1.40	2	0.70
STANDARDS OF CONSTRUCTION: - Project Experience - Plastic Pipe Experience - Inspection Procedures	8%	3	0.24	3	0.24
CUSTOMER SERVICE: - Appliance Service - Emergency Response - Conversion Assistance	7%	3	0.24	3	0.24
TOTAL			3.63		2.68

CHAPTER III

THE APPLICATION OF NORTHLAND UTILITIES (NWT) LIMITED

III THE APPLICATION OF NORTHLAND UTILITIES (NWT) LIMITED

A. INTRODUCTION

Northland submitted its initial application for a franchise to the Town of Hay River on March 21, 1983. Following the issue of the "Guidelines for Distributor Applicants" by the Board, Northlands resubmitted this application on September 14, 1983 together with an addendum. This addendum addressed the issues outlined in the guidelines and included additional information that was not in the original application.

The sections following examine the application and discuss the capability of Northland to distribute natural gas in the specified communities.

B. MARKET FORECAST

The principal market for which a franchise has been applied is that of the Town of Hay River. In addition, the Town of Pine Point was also examined, as were a number of smaller communities adjacent to the proposed transmission line from the Alberta-Northwest Territories border. These include Dene Village, Enterprise, Paradise Gardens, Delancy Estates, Market Garden, and Patterson Lumber Mill Residential, (referred to hereafter as the adjoining communities).

The forecast of total customers and annual sales volumes by the end of the third year of operation is shown in Table III-1.

TABLE III-1

TOTAL CUSTOMERS AND ANNUAL SALES VOLUME
AT END OF THIRD YEAR

	Customers	Annual Sales (TJ)
Residential		
Hay River*	756	159
Pine Point	586	127
Sub-Total	1,342	286
Commercial		
Hay River*	137	202
Pine Point	55	58
Sub-Total	192	260
Industrial		
Hay River*	3	300
Pine Point	1	386
Sub-Total	4	686
TOTAL	1,538	1,232

*Adjoining communities included.

Northland has indicated that the average annual consumption for residential customers was calculated to be 217 GJ for Hay River and 229 GJ for Pine Point. This works out to approximately 33% greater than in a city such as Winnipeg, Manitoba. However in comparing the degree day deficiencies for Hay River (7902) and Winnipeg (5923) this difference is realistic.

Northland has stated that it expects to achieve a market penetration of 95% in the second year of operation. Whether it will be able to obtain such saturation in this time frame will depend to a large extent on the assistance it offers potential customers to convert and to the differential between the cost of gas and the cost of potential customers' present heating arrangements. Should conditions be favourable, attainment of the conversions assumed by Northland are reasonable.

C. CONVERSION INCENTIVE PROGRAM

The Conversion Incentive Program proposed by Northland to achieve the desired saturation would run in conjunction with the Federal Government's Canadian Oil Substitution Program (COSP). COSP provides a taxable grant of one-half of the cost of converting from oil to gas, up to a maximum grant of $800.00. Northland proposes to supplement this by providing one-half of the conversion cost in excess of $1,600.00 up to a maximum subsidy of $500.00.

Applying the combined incentive programs, a consumer presently using oil could convert to natural gas and receive a maximum subsidy of $1,300.00.

Northland has indicated that a customer converting to gas would be required to pay for the service line from the property line to the meter set, and that this cost would form part of the cost of conversion for both the COSP and Northland's Conversion Incentive Program. Northland has estimated that a service line would cost approximately $250.00.

Since potential gas customers that are presently using an energy source other than oil, such as wood, are not eligible for a COSP grant, Northland proposes to provide a subsidy for these customers up to a maximum of $500.00.

The proposed Conversion Incentive Program appears to be reasonable for the average installation. Northland, however must ensure that an adequate number of furnace installers will be available to handle the necessary conversions at a competitive price.

D. DISTRIBUTION SYSTEM DESIGN AND CAPITAL COSTS

Northland provided a detailed design of the distribution system for Hay River and Pine Point. The piping system, incorporating a looped configuration, appears to provide adequate coverage of the two communities.

Northland has proposed using a combination of steel and plastic pipe with steel being used for main sizes larger than 114 mm (4 inches). Such steel pipe would be grade 290 and covered with a polyethylene coating. Plastic pipe would be produced from a 3406 or similar resin, and approved fusion connection methods would be employed.

The distribution system would have a maximum operating pressure of 410 kPa (60 psi) but would normally operate between 340 kPa and 140 kPa (50 psi and 20 psi).

The system design is reasonable and the methods proposed for installation are in accordance with accepted practice.

Northland submitted a summary of the capital cost of building the distribution system, assuming installations would be carried out in the three-year period 1984 to 1986. In Table 6.2.(a) and (b) of the submission total capital costs for Hay River and Pine Point were $3,579,000 and $2,022,000 respectively, for a total of $5,601,000. Included in the Hay River cost are costs to provide service in the smaller communities adjoining the transmission line. These costs are summarized in Table III-2.

TABLE III-2
PROJECTED CAPITAL COST OF FACILITIES
IN FIRST THREE YEARS OF OPERATION
($000) 1983 DOLLARS

	Hay River and Communities	Pine Point	Total
Mains	2,475	821	3,296
Services	383	712	1,095
Meters and Regulators	181	129	310
Conversion Incentive Program	355	260	615
Gate Stations	100	75	175
Communications	15	15	30
Tools, etc.	70	10	80
	3,579	2,022	5,601

Northland did not provide material quantities or detailed calculations to show how it arrived at the summaries shown. It did however provide an explanation of how the costs were calculated, noting that it based its costs on 1982 actual construction costs of its affiliated utility, adjusting these accordingly to 1983 dollars.

E. UTILITY STAFFING

Northland proposes to utilize the existing office and storage facilities presently occupied by its electrical distribution staff. This would be its main center and would be staffed by three employees who would operate the gas distribution and transmission facilities. An additional employee would be located in Pine Point to handle operations there, with emergency backup provided from Hay River. This would reduce the capital investment and work to reduce eventual consumer rates.

Other functions, such as clerical, meter reading and bill collection would be combined with the electrical facility. A combination of the two utilities sharing these costs will also work to reduce operating and maintenance costs and provide a degree of backup support in case of emergency.

Major financial, engineering and management services would be provided by staff located in Edmonton.

Northland has indicated that it will provided a variety of services to its customers to ensure the safe operation of the customer's natural gas appliances. Emergency service for suspected gas leaks or furnace shut-offs would be provided on a 24-hour basis. Since experienced heating contractors may not be readily available in the communities, Northland would carry out various inspections and adjustments of customer's appliances at no charge and would advise the customers on all aspects of natural gas usage.

A payment equalization plan will also be provided to allow customers to spread their gas bill payments equally over a 12-month period.

F. FRANCHISE AGREEMENT

Northland included a draft franchise agreement with its submission, based on a 20-year period renewable. The draft agreement covers all the necessary requirements but would be subject to further negotiation.

The proposed franchise agreement would give Northland the exclusive right to distribute natural gas in the Town of Hay River. It would contain an obligation upon the utility to pay a franchise tax in lieu of assessment of a property tax on the facilities of the utility located within the municipal boundaries. Such tax would consist of a percentage of the utilities revenue derived from the sale of natural gas in the franchise area. In Alberta, similar municipal taxes paid by the utility provide the towns that are served with 3 to 10 percent of the total revenue received by the utility.

During the hearing, Northland pointed out that a requirement of the Federal Government for assistance grants was that the Company applying for the grant had to have an approved franchise agreement with the community. Also, Gas suppliers are hesitant about making committments to a company that does not have a firm franchise agreement. Accordingly, Northland proposed that the Town consider granting a five-year renewable franchise instead of the 20-year agreement as originally proposed. This would give Northland the authority to negotiate Federal funding and gas supplies, but would not tie the Town to a long term agreement if such negotiations were to fall through.

In response to Northland's suggestion the Town requested that Northland explore the legal aspects if it were given a letter of intent prior to a final franchise agreement being entered into.

G. GAS SUPPLY

Northland has stated that it had investigated all known gas supplies which could be used to supply Hay River. The two principal sources are:

a) The Cameron Hills area of the Northwest Territories.
b) The existing gas field near Zama Lake in Northern Alberta.

In either case, gas would be carried by a transmission line to Hay River and Pine Point. Such a transmission line would follow the present right-of-way of the highway to these communities.

Northland has indicated that it carried out extensive investigation of these two sources and has determined the following:

a) Cameron Hills

Initially Cameron Hills field appeared to be the best prospect for a gas supply, with three wells located approximately 50 miles south of Hay River. On closer inspection, however, it was found that collectively the wells could supply the volume required, but individually none of the wells had sufficient deliverability. Accordingly, if one well was to experience trouble and have to be shut down, the others could not meet the requirement.

In addition to the quantity, the gas produced from these wells is sour and would required the building of a gas processing plant to remove the hydrogen sulphide. Such a plant would undoubtedly be built near the field.

b) Zama Lake

The alternative source of supply proposed by Northland, was a connection to the Alberta transmission system near Zama Lake. This would ensure a secure supply of gas, but a long and costly pipeline would have to be constructed. Northland has had estimates prepared by NOVA, an Alberta Corporation, to construct a pipeline to the Alberta-Northwest Territories border. Northland would then construct the pipeline from the border to Hay River and Pine Point.

Initial estimates received from NOVA indicate that the pipeline from Zama Lake to the border would cost some $20,000,000. NOVA has indicated that it cannot roll this cost into its Alberta cost of service, and would therefore require that a surcharge be levied on the contract demand in the amount of some 5.6 million dollars per year for 35 years. Such a surcharge would increase the cost of gas to the customer by a considerable amount.

During the hearing, Northland indicated that it was continuing its investigation into various means of lowering the cost of supplying gas. One way proposed was to construct the line from Zama Lake itself, provided that it would be permitted to do so by the Alberta Government.

CHAPTER IV

THE APPLICATION OF ICG UTILITIES (NORTHWEST TERRITORIES) LTD.

IV. THE APPLICATION OF ICG UTILITIES (NORTHWEST TERRITORIES) LTD.

A. INTRODUCTION

ICG-NWT initially applied to the town of Hay River for a natural gas franchise in February 1983. With the issue of the "Guidelines for Distributor Applicants" by the Board in July 1983, ICG-NWT revised its original application to conform to the guidelines and submitted this to the Board on September 14, 1983.

At the time of the second submission, ICG-NWT indicated that it still had some estimates to complete and would file these later. Subsequently, ICG-NWT filed another revised version on November 29, 1983, in which it only addressed aspects of distribution, stating that were it to deal with gas supply it would conflict with the natural gas and propane study soon to be conducted by the Federal and Territorial Governments.

In our review of the ICG-NWT application we have examined the November version together with the testimony and evidence presented at the hearing. The sections following discuss the capability of ICG-NWT to distribute natural gas in Hay River and Pine Point.

B. MARKET FORECAST

In its application, ICG-NWT submitted three alternatives to distribute natural gas in the Territories. These are:

1. Hay River and Enterprise,
2. Hay River, Enterpise and Pine Point,
3. Hay River, Enterprise, Pine Point, Yellowknife, Rae-Edzo, and Fort Providence.

Included in each alternative would be the smaller communities adjoining the proposed transmission line, such as Paradise Gardens, Delancy Estates, Market Garden, and Kakiska. A market forecast for these communities is not included in the quantities listed below.

While ICG-NWT has provided market forecast and calculations for an extension of the transmission line to Yellowknife, thereby serving a number of other communities, we will consider only those alternatives (1 and 2) which deal with distribution in Hay River, Pine Point and the smaller communities along this part of the proposed transmission line.

The forecast of total customers and annual sales volumes proposed for the system at the end of the third year is shown in Table IV-1.

TABLE IV-1

TOTAL CUSTOMERS AND ANNUAL SALES VOLUMES
AT END OF THIRD YEAR

	Customers	Annual Sales(TJ)
Residential		
Hay River, Enterprise	713	162.4
Pine Point	679	134.1
Sub-total	1,392	296.5
Commercial		
Hay River, Enterprise	114	99.4
Pine Point	33	35.8
Sub-total	147	135.2
Large Commercial-Industrial		
Hay River, Enterprise	16	75.8
Pine Point	3	7.0
Sub-total	19	82.8
Industrial		
Hay River, Enterprise	2	270.0
Pine Point	2	338.5
Sub-total	4	608.5
TOTAL	1,562	1,123.0

Of the 1392 residential customers forecasted for conversion to natural gas, 1206 are presently using oil, 168 are presently using propane, and 18 are unspecified. ICG-NWT have assumed that 100 percent of the residential propane customers would convert to natural gas in the first year and 70 percent of the oil customers. In Pine Point, it has been assumed that 75 percent of possible residential conversions would be made in the first year that natural gas is available.

C. CONVERSION INCENTIVE PROGRAM

ICG-NWT has stated that the natural gas rate establised for Hay River and Pine Point must be 25 to 35 percent less than competitive fuel rates to achieve successful market penetration. In addition, potential customers will have to be encouraged to convert by providing financial assistance to carry out the conversion.

The Canadian Oil Substitution Program (COSP) will provide a taxable grant of 50 percent of the conversion cost to a maximum grant of $800. ICG-NWT intends to augment the COSP grant so that 75% of all residential customer's cost are paid.

In addition to the incentive grants noted, ICG-NWT has indicated that it will install up to 30 metres of service line to residential and commercial customers at no charge. This will be of particular benefit to those who are presently using an energy source other than oil, thereby being ineligible for a COSP grant. The cost of this program, estimated at $840,000 would be included in ICG-NWT's capital cost and the consumer's rates.

D. DISTRIBUTION SYSTEM DESIGN AND CAPITAL COSTS

ICG-NWT provided detailed layouts of the proposed distribution system in the major communities together with a schedule and description of the materials that would be used. Based primarily on an open system of design, the system would minimize road crossing and would facilitate expansion or reinforcement of the system if this was required in the future.

The system would utilize a combination of steel and plastic pipe, with plastic being used generally for sizes under 114 mm (4inch).

The system would contain both intermediate pressure (1200 kPa or 175 psi) and medium pressure (415 kPa or 60 psi) lines. The main line that would transport the gas from the town border station through the town of Hay River would be at the intermediate pressure. The remainder of the system would be at the lower pressure.

ICG-NWT also submitted designs for Yellowknife, Rae-Edzo and Fort Providence.

Design of the systems was based on approved CSA Standards and made in accordance with accepted design formula and practice. The design has been examined and found to be reasonable.

The capital costs associated with the installation of the distribution systems in the various communities were provided in considerable detail. A summary of the projected capital cost of facilities for the first three years of the system is shown in Table IV-2.

Costs are based on construction of the distribution systems during the summer of 1985, in preparation for delivery of gas to customers in the fall of 1985. By year end 1985, ICG-NWT has forecasted that it will have converted 95% of the potential customers in Hay River, while 100% of potential customers in Pine Point, by year-end 1985 would be converted.

TABLE IV-2

PROJECTED CAPITAL COST OF FACILITIES
IN FIRST THREE YEARS OF OPERATION
($000) AS SPENT DOLLARS

Description	Hay River Enterprise	Pine Point	Total
Franchises and Consents	8.40	8.40	16.80
Other Intangible Plant	8.40	8.40	16.80
Intangible Opening Plant	320.00	30.00	350.00
- Intangible Plant	336.80	4.68	383.60
Land	5.60	3.40	9.00
Structures and Improvements	20.10	20.20	40.30
Services	656.80	1,115.70	1,772.50
House Regulators & Meter Installations	109.40	79.90	189.30
Mains	1,279.30	288.80	1,568.10
Measuring and Regulating Equipment	233.80	110.80	344.60
Meters	92.40	60.90	153.30
- Distribution Plant	2,397.40	1,679.70	4,077.10
Land	44.80	-	44.80
Structures and Improvements	145.50	-	145.50
Office Furniture and Equipment	5.60	2.80	8.40
Transportation Equipment	33.60	16.80	50.40
Tools and Work Equipment	11.20	5.60	16.80
Equipment on Customer's Premises	419.20	421.63	840.83
Communication Structures & Equipment	2.80	2.80	5.60
- General Plant	662.70	449.63	1,112.33
Unclassified Plant			
Cost of Engineering and Supervision	355.76	248.42	604.18
Administration Overhead Capitalized	70.30	19.80	90.10
Allowance for Funds used during Construction	105.00	61.00	166.00
- Undistributed Plant	531.06	329.22	860.28
GRAND TOTAL	3,927.96	2,505.35	6,433.31

The proposed franchise agreement would give ICG-NWT the right to distribute gas in the Town of Hay River, gas being defined as "natural gas, synthetic natural gas, liquified natural gas, liquified petroleum gas, manufactured gas...distributed through a piped system". Company witnesses indicated that this was a caveat to prevent anyone running another distribution system in the Town using something other than natural gas.

At the time that ICG-NWT submitted its application for a franchise, the Federal and Territorial Governments were conducting a study to determine what form of energy should be considered for various communities in the Northwest Territories, Hay River being one of those communities. For this reason, ICG-NWT had revised its application deleting specific reference to gas supply and transmission. Since this and other aspects of gas are still uncertain, it was suggested that something less than a franchise agreement as proposed be considered, such as a short term agreement. This would give ICG-NWT authority to proceed with negotiations for gas supply and Federal grants. Should it be successful in this respect, a formal long term agreement would be entered into. However, ICG-NWT has proposed that the 21-year franchise be granted with a clause which would measure its performance in two or three years.

G. GAS SUPPLY

As previously stated, ICG-NWT has assumed that gas supply will be made available at the Town border station and did not include within the revised application details of gas supply and transmission. Nevertheless, when questioned on this subject, ICG-NWT provided copies of correspondence that dealt with this subject.

Two sources of gas supply have been examined, and estimates of quantity and cost have been obtained. These sources are:

a) Indigenous sources in the Cameron Hills area.

b) Supply from the Zama Lake area by NOVA, an Alberta Corporation.

a) Cameron Hills

ICG-NWT has indicated that it had received information from the producer in the Cameron Hills field that there are proven reserves of 8 BCF now available with a possibility of an additional 30 BCF. Existing reserves could last for 9 years although present reliability has not been proven. Additional wells would have to be drilled to increase reliability.

Gas from this area is sour and would require the construction of a processing plant to make it safe for distribution. The producer has estimated that it would take nine months to construct the facilities and put the gas on stream.

ICG-NWT proposes to construct the transmission line from this source should it prove to be the most feasible. However it would only be able to do so if the line was fully funded through government grants.

b) Zama Lake

Correspondence with NOVA, an Alberta Corporation, outlines a secure supply of natural gas from the system at Zama Lake. NOVA has indicated that it could extend its system to the Northwest Territories border, at which point ICG-NWT would be required to extend the line to Hay River and Pine Point.

To build the line, NOVA has estimated the cost at $17,550,000, covering this by an annual surcharge of over $4 million for 35 years.

ICG-NWT has indicated a preference for the Cameron Hills supply, and has proposed that further negotiations and investigations should be carried out with the producer. It noted however that ICG-NWT would require some form of franchise agreement before firm committments could be obtained from the producers.

CHAPTER V

MAJOR ISSUES

V. MAJOR ISSUES

A. INTRODUCTION

There are several issues of major importance that must be examined and a solution found before a natural gas distribution system can be considered for Hay River and Pine Point. These include:

- Provision of an adequate supply of gas,
- The cost of providing the service,
- The availability of government DSEP grants to finance construction of the system,
- The awarding of a franchise to one of the applicants to install the distribution system.

This chapter will examine the proposals of the applicants in dealing with these issues.

B. GAS SUPPLY

1. General

The principle issue which must be resolved before gas distribution is undertaken is the question of a secure and reliable supply of gas to the town gate stations of Hay River and Pine Point. This section of the report discusses two alternative sources of supply which have been considered by both applicants and the price of the gas which will make up the largest cost component of the consumer's natural gas rate.

There are no known sources of natural gas in the immediate vicinity of Hay River or Pine Point. However, there are two alternatives for delivering a supply into the area: (i) a pipeline to Hay River from a plant in the Cameron Hills area of the Northwest Territories; and, (ii) a pipeline to Hay River from the Alberta/Northwest Territories border connecting to an extension from the existing NOVA system near Zama Lake.

The Cameron Hills field is located within the Northwest Territorial boundaries and lies approximately 130 kilometres southwest of Hay River. Immediately south of this field are two other gas fields known as Indian Cabins and the Ratz field which, although located in Alberta, are close enough to Cameron Hills to be considered a potential source of supply for a gas processing plant. These three small gas fields are presently the closest supplies of gas for Hay River.

A second potential source of supply is through an extension of the NOVA system in Alberta to the Alberta/Northwest Territories border. At the border point, the supply line would connect to a transmission pipeline facility in the Territories for transportation of the gas to Hay River and Pine Point.

2. Cameron Hills

a) Supply

Both applicants agreed that, at this time, the Cameron Hills field is not a secure source of gas supply for the market to be served. Northland, in its evidence, had examined the field potential within the gas supply department of its parent company, and additionally, had retained the services of a recognized expert in the industry (McDaniel and Associates) to provide an objective and independent appraisal of the gas field. ICG-NWT contacted two producers and relied on the information provided by the companies in their appraisal of the potential supply.

In general, the Cameron Hills field is considered a small reef development with prospects for oil production. Drilling activity to date, although showing indications of oil, has proven up approximately 8 Bcf of natural gas. However, the gas contains hydrogen sulphide (H_2S) and must be scrubbed and cleaned before it can be transported and marketed in the towns. The amount of H_2S is substantial (1500 grains) and would require a desulphurization plant to remove the impurity to less than five grains for domestic use.

The 1983-84 drilling activity has so far not added to the proven gas reserves of the field. Although one more well of a two-well program is planned for this year, there is no indication as to the timing or prospects for the second well. It is reported that the first well of this year's program failed to find gas in commercial quantities. The well is presently cased and standing pending tests for possible oil production.

b) Gas Reserves

The market studies of both applicants indicated that a 20-year gas requirement for Hay River and Pine Point would be in the order of 25 to 30 Bcf of gas. Among the many other considerations, a prudent utility owner would likely require, as a minimum, this volume of reserve in place before undertaking any investment in transmission and distribution facilities. Northland, the only applicant to carry out a detailed analysis of the Cameron Hills gas field indicated that existing proven recoverable reserves, at the present time, were approximately one-third of that required to meet the long-term needs of the two communities.

A realistic estimate of the maximum day delivery from Cameron Hills would be approximately 4 to 6 MMcf/d; both Northland and ICG-NWT indicated a maximum day requirement in year five of 9 to 11 MMcf/d. It was the opinion of both applicants that the Cameron Hills field supply was inadequate, both from the point of view of recoverable reserves and the ability of the wells to meet the maximum day requirement.

If or when Cameron Hills has an adequate supply of gas in the future a substantial gas processing plant investment by either the gas producer or the utility would be required. As noted earlier, the gas is sour and requires sweetening through the operation of a small gas processing plant.

c) Gas Cost

Northland estimated that the capital cost of a plant would be in the order of $7.5 million, and the operating and maintenance costs would be $200,000 per year. Combined with the gathering and processing, the additional cost would add approximately $1.75 per Mcf to the wellhead price, assuming a price could be negotiated with the producers and the federal government relating to royalty.

A letter dated September 9, 1983 from a producer (Paramount Resources) submitted by ICG-NWT indicated that a price of $3.75 per Mcf would be required. Assuming the price quoted was for marketable gas at the outlet of the processing plant (the letter is unclear on this issue), the netback to the wellhead would provide a producer with a revenue of about $2.00 per Mcf (1983 $). The annual price escalation provision in the letter (one percent plus inflation) would probably result in a price equal to or slightly better than would be available to a producer at the wellhead if the gas were being produced in Alberta.

3. Steen River Lateral Supply

To supply the gas requirements of Hay River and Pine Point, both applicants preferred to purchase natural gas in Alberta for delivery to the Alberta/ Northwest Territories border. Approval for such an arrangement must be obtained from the National Energy Board for the delivery of gas across the border. In addition, to construct the line in Alberta requires the approval of the Alberta Energy Resources Conservation Board.

The cost of gas at the Alberta border has been set by agreement between the governments of Canada and Alberta and would be the same as the price of gas currently leaving the Province (i.e., $2.78 per GJ at February 1, 1984) either east or west, unless a special agreement was entered into by both governments. By its Charter, NOVA, AN ALBERTA CORPORATION, has the exclusive right to transport gas within the Province for delivery beyond the provincial border. Therefore, any pipeline for export of gas must be built by this Company unless it chose to waive its right in this particular situation.

Both applicants indicated that they would negotiate contracts with producers for delivery into the NOVA system and that the price for such gas would be the Alberta border price less the Alberta cost-of-service (currently about 30 cents per Mcf). By letters dated September 8, 1983 to Northwestern Utilities (Northland's parent) and November 3, 1983 to ICG (Plains Wester), NOVA indicated that an annual surcharge would be required over and above the usual tariff for transporting gas in the Province. Depending on the maximum day requirements specified and the terminal pressure requested, the surcharge would be between $4 and $5.7 million per year.

It should be noted that the two NOVA letters specified different surcharges because different terminal pressures and volume throughputs were requested. However, when the line size and terminal pressure are ultimately agreed upon, the surcharge would be the same for any company proposing to receive service through a NOVA facility.

In the absence of any capital contribution in aid of construction, a surcharge of this magnitude would mean that the gas cost at the Northwest Territories border would be the sum of the Alberta border price and $4 to $5 per Mcf. The total cost of gas at this point, therefore, would be unrealistic in terms of providing an economic price at the town gate and a feasible project.

Recent discussions with NOVA indicated that the company would not consider rolling the cost of this proposed lateral into its overall cost-of-service. The reason being that such a large investment relative to throughput would be too great and cause an imbalance between the average investment of the company and the incremental investment to serve this market. The result, therefore, would be that Alberta's gas producers, who pay the NOVA cost-of-service, would be unduly penalized by way of higher tariffs which affect netback revenue and also provincial royalty.

When asked in a February 7, 1984 phone call as to what contribution would be required to eliminate the surcharge, NOVA commented that of the $19.5 million capital investment noted in the Northwestern letter of September 8, 1983, NOVA would probably have to receive a subsidy between $14 and $15 million. However, a final decision could only be made after a complete design was done and the final cost estimates prepared.

C. COST-OF-SERVICE

1. Transmission Lines

The NOVA letter to ICG (Plains Western) of November 3, 1983 referred to a capital cost of $17.6 million and an annual surcharge of $4 million. The Northwestern letter from NOVA noted $19.5 million and a surcharge of $5 million. The difference between the two NOVA pipeline estimates is a result of different capacities requested. Northwestern requested a pipeline configuration capable of approximately 10,770 Mcf/d @ 800 p.s.i. ICG (Plains Western) specified it required about 8000 Mcf/d @ 700 p.s.i. It should be noted that the Northland market projection requires a peak day delivery of 10,800 Mcf/d. The ICG market forecast, however, required 8535 Mcf/d in the second year of operation, suggesting that this line configuration could be undersized.

It is the opinion of the Consultant that the cost of the lateral line as estimated by NOVA will approximate $19.5 million in capital cost.

ICG submitted that it would expect the transmission facilities from the Alberta border to the town gate stations to be fully funded either through DSEP grants or some form of supplemental funding by Federal or Territorial governments. The Company did not provide any rate base or cost-of-service projections for facilities upstream of the town gate stations.

Northland provided a complete projection of capital costs, rate base and cost-of-service from the Alberta border to the town gate. The plan as forecast indicated that a DSEP grant of $15 million for transmission would be required. Although not specified, it suggested that the company would be prepared to invest $2,750,000, the difference between the DSEP grant and the total capital cost.

The following tabulation shows the projected capital cost of facilities for the first three years of operation, allocated between transmission and distribution.

	$ 000 1983
Total Property, Plant and Equipment	8,351 1/
Distribution	5,601 2/
Difference to Transmission	2,750

2. Purchased Gas Cost

Assuming that a special federal lateral pipeline grant were made available to eliminate a NOVA surcharge, then the price of gas at the Alberta/Northwest Territories border at February 1, 1984, would be as follows:

	Dollars Per GJ
Alberta Border Price	2.79
Canadian Ownership Account	0.14
Total	2.93

3. Natural Gas Rates

Northland submitted, in Schedule 8.5, that the cost-of-service, measured in 1983 dollars, over ten operating years, would average $4.91 per GJ calculated from Schedule 8.5, page 57 and from Schedule 8.1, page 53, as follows:

Total Utility Revenue	$55.4 million
Total Sales (10 Years)	11,283 TJ
Average	$4.91/GJ

1/ Schedule 8.4, Northland Submission.

2/ Table 6.2(a)(b), Northland Submission.

Deducting the estimated ten-year cost of purchased gas at the Alberta/Territorial border of $21,279,000 showed an average cost-of-service for transmission and distribution of $1.89 per GJ or approximately $2.00 per Mcf. The average consumer rate, therefore, as measured in 1983 dollars would remain at approximately $4.91 per GJ ($1.89 plus $2.93) after the February 1984 change in gas price at the Alberta border.

4. Cost of Competitive Fuels

Both applicants provided certain specific alternate fuel costs for Hay River and Pine Point at selected times in 1983 as follows:

	Fuel Oil ($ per GJ)	Propane ($ per GJ)
Northland, March 1983	9.88	9.80
ICG, September 1983	9.62	10.64
Northland, October 1983	9.83	10.64

No commodity value of competing fuels was calculated by either applicant. However, assuming that about 25 percent of the total competitive energy being used is propane 1/ and 75 percent is fuel oil, an approximation of a 1983 commodity value would be in the order of $9.90 2/.

Comparing Northland's estimated average cost-of-service of $4.91 per GJ indicates that natural gas could be delivered at about 50 percent of alternate fuels. The basic premise, of course, is that a DSEP grant of $25 million (1983 dollars) would be available towards the project.

1/ From supplemental data submitted by applicants. 2/ Weighting of average prices during 1983.

D. AVAILABILITY OF FEDERAL GRANTS

It has been clearly demonstrated by both of the applicants that the construction of a transmission and distribution system to provide natural gas service to Hay River and Pine Point cannot be done economically at this time without significant government assistance. Accordingly the applicants have investigated the various assistance programs offered by the Federal Government, including:

1. COSP - Canada Oil Substitution Program,
2. DSEP - Distribution System Expansion,
3. ICAP - Industrial Conversion Assistance Program,

COSP was introduced to encourage the substitution of oil with other forms of energy which are available within Canada. By this means there would be a transition away from a dependence on oil, allowing the conserving of domestic supplies for consumers unable to employ alternatives.

COSP has two components for providing financial assistance to encourage this substitution. The first program provides assistance to oil consumers to convert to natural gas, electricity, or other energy sources, in the form of a grant of 50 percent of the cost of conversion up to a maximum of $800.00. This was discussed previously in Subsections III(c) and IV(c) herein.

The second component, DSEP, provides financial assistance to natural gas utilities to assist in the expansion of the natural gas distribution network. Such assistance is limited to the expansion of facilities which are not financially viable for a utility to construct and operate without causing an undue rate burden on existing consumers. Funds made available by DSEP are applied as contributions in aid-of-construction to help offset the high capital cost of expanding natural gas distribution systems.

The Consultants have had discussions with program administrators in Ottawa [1/], and have been told that these incentive programs will be made available to consumers and utilities in the Northwest Territories on a similar basis as in other parts of Canada. It should be noted, however, that the program terminates on March 1, 1987 and that any applications for funding under DSEP must be completed before March 1, 1986.

In its submission, Northland indicated that a DSEP grant of $10 million would be required to make the Hay River and Pine Point systems viable, and $6.7 million if only Hay River was to be serviced. In addition, would require funding for the Steen River lateral of $15 million.

ICAP has been established to provide contributions to industrial and commercial establishments and private institutions to help them meet the costs of converting boilers and process heaters to natural gas. Eligibility for such is limited to applicants that are currently using No. 6 oil, and the natural gas must not be used for generation of electricity that will be sold. As a result, conversion of the diesel generation plants in the Territories would not be eligible under the present plan.

The conversion of the APL generation plant in Hay River will be converted only if it is economic to do so.

Construction of the Steen River Lateral Pipeline would require funding of approximately $15 million, which is not available under existing

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1/ Ms. Gay Richardson
DSEP Coordinator
Energy Mines and Resources Canada

Federal Government programs. However, special grants were made available for the extension of laterals in the Province of Quebec, opening the way for negotiations between the Federal and Territorial Governments for similar treatment. The successful applicant will need to work closely with the Territorial Government, NOVA, the Alberta Government and Gas Producers in any future negotiations.

E. A FRANCHISE AGREEMENT

It is apparent that a considerable amount of work is required to be done (at significant cost) before an assured supply of gas can be proven to be available at a reasonable price for the two communities. Some of the major issues which must be resolved are listed as follows:

1. The Steen River lateral pipeline requires final design and costing.
2. An agreement is required with NOVA relating to the level of capital contribution in aid of construction required to eliminate the need for a surcharge.
3. A distributor with the support of the town and the Territorial Government must arrange for government funding or a contribution to the pipeline in some form up to the Alberta border.
4. A sizable DSEP grant must be applied for (prior to March 1, 1986) and a clear indication given that it will be available if or when the distributor proceeds with construction.
5. National Energy Board approval must be obtained for the export of gas from Alberta.
6. Energy Resources Conservation Board and Alberta Cabinet approval must be obtained for export from Alberta.
7. Routing and design engineering is required for the transmission line in the Territories.

There are numerous other arrangements and agreements required in connection with such items as gas contracting of reserves and pricing, however, the above appear to be the important issues.

Alternative arrangements could, however, be worked out between the town and the selected applicant, such as a letter agreement or a short-term contractual arrangement. It is beyond the scope of this report to recommend specifically what is needed at this time. Such terms can and should be worked out in negotiations between the two communities and the selected applicant in concert with the Northwest Territories Public Utilities Board.

It should be pointed out that the applicant selected will be required to spend substantial money before any assurance of funding and, therefore, gas supply can be obtained. There needs to be, therefore, a clear understanding as to the financial risks involved and what groups should bear such costs in the event of failure or in the event of ultimate success of the venture.

CHAPTER VI

ANALYSIS AND EVALUATION OF APPLICATIONS

VI. ANALYSIS AND EVALUATION OF APPLICATIONS

A. INTRODUCTION

To evaluate the proposals put forward by the two applicants, it was necessary to compare the submission one to another and to consider the completeness and reasonableness of what each applicant has proposed. This section will cover those aspects of the submission which we believe are necessary for the establishment of a viable distribution system.

B. MARKET FORECASTS

Both applicants examined the principal communities specified in the guidelines - Hay River and Pine Point - in considerable detail. In addition, each applicant surveyed other communities and addressed them in their particular submissions, but in different ways.

Northland proposes to serve the smaller communities of Dene Village, Enterprise, Paradise Gardens, Delancy Estates, Market Garden, and Patterson Lumber Mill Residential, in addition to the principal communities, and has included them in its market forecast and cost of facilities for the project.

ICG-NWT has indicated that it would also serve these additional communities, but did not include them in their capital cost estimates, other than for the community of Enterprise. ICG-NWT also submitted a market study for Yellowknife, which will not be discussed at length in this review.

The breakdown of potential customers has been listed in a slightly different manner by each applicant. A summary of the forecasted customer capture for the first three years by each applicant is shown in Table VI-1.

TABLE VI-1

FORECAST OF POTENTIAL CUSTOMERS
IN FIRST THREE YEARS OF OPERATION

Customers	Northland		ICG-NWT	
	Hay River(1)	Pine Point	Hay River(2)	Pine Point
Residential	756	586	713	679
Commercial	137	55	114	33
Large Commercial-Institutional			16	3
Industrial	3	1	2	2
TOTALS	896	642	845	717
	1538		1562	

(1) Includes Enterprises, Delancy Estates, Paradise Gardens, Market Garden, Patterson Lumber Mill Residential and Dene Village.

(2) Includes Enterprise.

The differences noted in the residential markets, particularily for Hay River, can be attributed in part to the extent of the survey made by each applicant. ICG-NWT has only included the community of Enterprise in its survey numbers, whereas Northland has included a number of other communities as noted above.

Only ICG-NWT has given an estimate and breakdown of the potential residential customers in Hay River by present energy use; Northland submitted a percentage breakdown, but no total number of customers. The results are given in Table VI-2.

TABLE VI-2

RESIDENTIAL HEATING CUSTOMERS IN HAY RIVER
BY PRESENT ENERGY USE

Present Heating Fuel	Northland		ICG-NWT	
	Number	Percentage	Number	Percentage
Oil	-	65	537	78
Propane	-	35	144	21
Other	-	-	6	1
TOTAL	-	100%	687	100%

From the foregoing it is evident that no significant differences exist between the two applicants in the results of their customer surveys.

The timing of customer hook-up by each applicant, as listed in the submissions, differs by one year. Northland indicates a start in 1984, while ICG-NWT indicates a 1985 start. However, in their discussion of project implementation it is evident that the timing of the gas transmission line construction will determine when work on the distribution system will begin. Considering all that would have to be done before gas is available at the town gates, including awarding of franchise, obtaining of Federal Grants, construction of transmission facilities, etc., it is doubtful that gas would be available in 1984. For our review, therefore, we have considered that such events as described would effect each applicant in the same way, and have compared years 1, 2, and 3, etc. instead of actual calendar years.

Each applicant forecasts a 95% penetration into the market after two years, which is a reasonable assumption given the differential between present fuel costs and estimated natural gas rates. To achieve this penetration, both applicants propose to offer incentives to residential customers over and above incentive grants available from the Federal

Government. These incentive programs have been described in subsections III(c) and IV(c) herein.

To compare the two incentive programs it might help if we show example calculations that would apply to residential customers converting to natural gas.

Example One

A customer presently using oil for heating has a furnace which is beyond conversion and needs complete replacement. Estimated cost of the new furnace installation is $1600.00.

	Northland	ICG-NWT
Cost of Conversion	$1600.00	$1600.00
Cost of Service Installation	250.00	N/C
Sub-total	1850.00	1600.00
Maximum COSP Grant	(800.00)	(800.00)
Company Incentive Assistance	(125.00)	(150.00)
Cost to the Customer	$925.00	$400.00

Example Two

A customer presently using propane for heating requires a minimum amount of conversion work to his present furnace. Estimated cost $200.00.

	Northland	ICG-NWT
Cost of Conversion	$200.00	$200.00
Cost of Service Installation	250.00	N/C
Sub-total	450.00	200.00
Company Incentive Assistance	225.00	150.00
Cost to the Customer	$225.00	$50.00

From the foregoing, it would appear that the incentive plan proposed by ICG-NWT will give the lowest cost to the customer converting to natural gas. It should be remembered, however, that the cost of the incentive plans will form part of the applicants' capital cost and will immediately be passed on to all customers through the rates.

C. PROPOSED RATES

The economic viability of the applicants to distribute natural gas in the communities of Hay River and Pine Point will depend on the ability of the successful distributor to attach the potential customers at rates which will provide significant savings in energy costs. Unless a potential customer can achieve sufficient savings to "pay-back" any cash outlay for converting existing appliances in a reasonable time, the customer will not convert.

To achieve successful penetration of the market, Northland has stated that the rates should provide natural gas at 50% of the cost of competing fuels to capture the residential, commercial, and industrial (electric generation) market. Accordingly Northland has indicated that an average rate of $4.91 per gigajoule is required. It is important to note that a rate of 50% of competing fuels is essential to provide the necessary incentive to convert the APL Generation Plant.

ICG-NWT has stated "...that natural gas rates must be 25% to 35% less than competitive fuel rates to achieve successful penetration."

Since the cost of gas purchased will make up some 85% of the rate charged for natural gas to the customer, achieving the savings indicated will depend to a large extent on the delivered cost of gas to the distributor. The remainder of the costs that make up the rate will vary between the two applicants, but not to the extent that would affect the final rate by an amount sufficient to account for the difference between the applicants' forecasts.

It should also be noted that proposed rates must be low enough to ensure that commercial and industrial customers will convert, since they account for a major portion of the forecast volumes. For example, the APL Generation Plant would consume as much natural gas as would all the residential customers in the communities studied. Converting this electric generating load to natural gas will be costly and would not be done unless there are appreciable savings to be gained by the electric utility and its consumers. If a distributor were unable to offer a competitive gas rate to the APL Generation Plant and this large industrial load could not be connected it would seriously effect the feasibility of the project.

D. ABILITY TO ATTACH INDUSTRIAL LOAD

Each applicant has identified industrial customers that it would expect to supply with natural gas. Those listed differ for each applicant and this is probably due to the way each applicant classifies its customers. That is, some customers classified as industrial by Northland would be classified as commercial by ICG-NWT.

Irrespective of the classification the major potential customers that have been identified are:

	Estimated Annual Requirements (TJ)
Hay River	
Water Treatment Plant	
APL Generation Plant	201 - 292
Fish Plant	
N.T.C.L. Synchrolift	68.9
Pine Point	
Cominco Mine	239.2
NCPC Generation Plant	99.2

Note: Estimated volumes taken from ICG-NWT application except for the higher volume (292) for APL Generation Plant.

Of the above potential customers, only NCPC Generation Plant is doubtful. This plant is not used to its capacity and according to the applicants it would be uneconomic to convert at this time. In addition, by agreement NCPC is responsible for the plant but Cominco is responsible for the operating costs. Accordingly, if converted any benefit derived would go to Cominco at NCPC's expense.

ICG-NWT has indicated that it would negotiate special contracts with the large industrial customers to supply firm service. Such contracts would be long-term, to protect both the utility and the non-industrial customers in the event of early termination.

Northland did not provide any details of the form of contract that it would propose for industrial customers.

The ability of either applicant to attach industrial customers to the system will depend to a large extent on the rates achieved for gas service. Northland's suggested rates at 50 percent of existing alternative energy would provide greater assurance of converting the APL Generation Plant than would ICG-NWT's suggested rates at approximately 75 percent of existing energy. Moreover, considering the ownership of the generation plant it is doubtful if ICG-NWT could achieve capturing this very significant load.

E. EFFECT ON ELECTRICITY RATES

As discussed previously, conversion of the APL Generation Plant in Hay River to natural gas has been considered by both applicants. While the gas load that would result from such a conversion would have a significant effect on the viability of the distribution system, there could also be a benefit to all users of electricity in Hay River providing the capital cost of conversion and reduced operating cost result in a lower overall cost of service for the electric utility.

Northland stated that the conversion of the generation plant to natural gas would entail a major capital outlay. Such costs would have to be amortized over a period of time to allow full recovery. Depending on the savings achieved from the lower priced fuel, some of these savings would be passed on to electricity customers. However, Northland could not forecast the extent of those savings in the absence of known gas costs.

F. ABILITY TO FINANCE THE PROJECT

The CU group of companies of which Northland is a part have been undertaking capital expenditure programs in the order of $150 million per year over the past few years. It is therefore reasonable to suggest that an $8.3 million capital expenditure over 3 years could be financed within the parent under terms and rates similar to those applying to the Alberta operations.

Although ICG-NWT is a significantly smaller company, it has the experience and resources that would ensure financing of a project of this size.

Northland has indicated that financing for the system would be arranged through its parent company Canadian Utilities Limited, which has "...proven its ability to obtain financing in public markets at the lowest possible cost." Canadian Utilities would pass on the financing costs at the same

rates and on the terms and conditions that it has obtained. Northland has proposed a financial structure based on 60% debt and 40% equity, with a debt rate of 12½ percent and a return on equity of 16 3/4 percent, subject to conditions in the market at the time that financing of the project is to take place.

ICG-NWT has also proposed a 60/40 debt equity ratio for financing the project. In its submission ICG-NWT provided examples of how financing would be accomplished by means of 12 3/4% and 13% debenture issues, and common shares giving a projected return of 16 to 16½ percent. Rates were based on present market conditions and would be subject to change at the time that actual financing occurred. As noted in the submission, project financing would be undertaken by ICG-NWT's parent, Inter-City Gas Corporation.

Both applicants would have the ability to arrange the financing for the project, through the resources of their parent companies. Due primarily to a more favorable rating by the Dominion and Canadian Bond Rating Services, Northland should be able to obtain debentures at a slightly lower rate than ICG-NWT. This is evident in the estimates presented by Northland and ICG-NWT in their submissions.

Regardless of their ability to arrange financing, neither applicant proposes to finance the project totally through debt and common equity. Rather they will seek to obtain substantial Federal grants, through programs such as DSEP - The Distribution System Expansion Program. Special funding to assist in the construction of the transmission line and distribution system will have to be negotiated for with the Federal Government, to make it economically feasible for natural gas distribution to take place in Hay River and Pine Point.